WHAT IS CLAIMED IS:

1. A method of transferring at least one DNA sequence into cells, comprising:

transducing said cells with a modified adenovirus including said at least one DNA sequence, wherein said adenovirus, prior to modification, is of a first serotype, and wherein, in the modified adenovirus, at least a portion of the fiber of said adenovirus of said first serotype is removed and is replaced with at least a portion of the fiber of an adenovirus of a second serotype, and wherein said cells include a receptor which binds to said at least a portion of the fiber of said adenovirus of said second serotype, and whereby transfer of said at least one DNA sequence into said cells is effected through binding of said modified adenovirus to said cells.

2. The method of Claim 1 wherein said fiber of said adenovirus includes a head portion, a shaft portion, and a tail portion, and at least a portion of the head portion of the fiber of said adenovirus of said first serotype is removed and replaced with at least a portion of the head portion of the fiber of said adenovirus of said second serotype.

3. The method of Claim 1 wherein said adenovirus of said first serotype is an adenovirus of a serotype within Subgenus C, and said adenovirus of said second serotype is an adenovirus of a serotype within a subgenus selected from the group consisting of Subgenera A, B, D, E, and F.

4. The method of Claim 3 wherein said adenovirus of said second serotype is an adenovirus of a serotype within Subgenus B.

5. The method of Claim 4 wherein said adenovirus of said first serotype is Adenovirus 5, and said adenovirus of said second serotype is Adenovirus 3.

6. The method of Claim 1 wherein said cells are selected from the group consisting of lung cells, hematopoietic cells, lymphoma cells, leukemia cells, smooth muscle cells, and tumor cells.

7. The method of Claim 1 wherein said cells are transduced with said modified adenovirus *in vivo*.

8. The method of Claim 6 wherein said cells are lung cells.

9. The method of Claim 6 wherein said cells are hematopoietic cells.

10. The method of Claim 6 wherein said cells are tumor cells.

11. The method of Claim 10 wherein said tumor cells are head and neck cancer cells.

12. The method of Claim 10 wherein said tumor cells are neuroblastoma cells.

13. The method of Claim 6 wherein said cells are lymphoma cells.

14. The method of Claim 6 wherein said cells are leukemia cells.

15. The method of Claim 6 wherein said cells are smooth muscle cells.

16. A method of transferring at least one DNA sequence into cells, comprising:

transducing said cells with a modified adenovirus including said at least one DNA sequence, wherein said adenovirus, prior to modification, is of the Adenovirus 5 serotype, and wherein, in the modified adenovirus, the head portion of the fiber of Adenovirus 5 is removed and replaced with the head portion of the fiber of Adenovirus 3, and wherein said cells include a receptor which binds to the head portion of the fiber of Adenovirus 3, and whereby transfer of said at least one DNA sequence into said cells is effected through binding of said modified adenovirus to said cells.

17. A modified adenovirus including at least one DNA sequence to be transferred into cells, wherein said adenovirus, prior to modification, is of the Adenovirus 5 serotype, and wherein, in the modified adenovirus, the head portion of the fiber of Adenovirus 5 is removed and replaced with the head portion of the fiber of Adenovirus 3.

18. A composition, comprising:

the modified adenovirus of Claim 17; and a pharmaceutically acceptable carrier.

19. A method of transferring at least one polynucleotide into cells, comprising:

contacting said cells with a gene transfer vehicle other than an adenovirus, said gene transfer vehicle including said at least one polynucleotide, and wherein said gene transfer vehicle includes at least a portion of the fiber of an adenovirus of a desired serotype, and wherein said cells include a receptor which binds to said at least a portion of the fiber of said adenovirus of a desired serotype, and thereby transfer of said at least one polynucleotide into said cells is effected through binding of said gene transfer vehicle to said cells.

20. The method of Claim 19 wherein said gene transfer vehicle includes at least a portion of the head portion of the fiber of said adenovirus of a desired serotype.

21. The method of Claim 20 wherein said gene transfer vehicle includes the head portion of the fiber of Adenovirus 3.

22. A gene transfer vehicle other than an adenovirus which includes at least a portion of the fiber of an adenovirus of a desired serotype.

23. The gene tranfer vehicle of Claim 22 wherein said gene transfer vehicle includes the head portion of the fiber of Adenovirus 3.

24. An adenovirus of the Adenovirus 3 serotype including at least one heterologous DNA sequence.

25. A composition, comprising:

the adenovirus of Claim 24; and a pharmceutically acceptable carrier.

26. A method of transferring at least one heterologous DNA sequence into cells, comprising:

transducing said cells with the adenovirus of Claim 24, and wherein said cells include a receptor which binds to the fiber of Adenovirus 3, and whereby transfer of said at least one heterologous DNA sequence is effected through binding of said adenovirus to said cells.

27. A method of transferring at least one polynucleotide into cells, comprising:

contacting said cells with a gene transfer vehicle including said at least one polynucleotide, wherein said gene transfer vehicle includes at least a portion of the fiber of Adenovirus 3, and wherein said cells include a receptor which binds to at least a portion of the fiber of Adenovirus 3, and whereby transfer of said at least one polynucleotide into cells is effected through binding of said gene transfer vehicle to said cells.